

GENERAL COMMENTS

Overall

Commenting Organization: EPA
General Comment #: 1

Commenter: Saric

The FS needs to reflect that the original FS was submitted to EPA with the ASTM and that this version has been rewritten. The entire ASTM will not be resubmitted as an attachment as it was in the original document, but portions have been reformatted and incorporated into this FS to support the discussion of the remedies. Sections of the ASTM that were directly incorporated into this document (i.e. Appendix G) were not revised based on EPA comments. These comments and changes must be addressed in this document.

Risk Assessment

Commenting Organization: EPA
General Comment #: 2

Commenter: Saric

The report can do a much better job summarizing the TBERA. There were comments that were made by EPA that were not included in the corresponding attachments and the conclusions and uncertainty discussion provided is not consistent. See the specific comments provided below for additional detail.

Commenting Organization: EPA
General Comment #: 3

Commenter: Dillon

EPA has worked with GP to develop balanced language regarding the uncertainties associated with the risk estimates presented in the TBERA. This was extended to the language in ASTM. Further concerns were raised about the language in the Arcadis FS concerning the description of risk. EPA had provided comments. The summary of the TBERA does not adequately present a balanced interpretation of the results or address concerns raised by EPA to GP in the ASTM and Arcadis FS. Please review comments on the Arcadis FS concerning the presentation of ecological risk.

Alternatively GP could consider replacing Section 1.3.3.3 with the following text taken from the ASTM.

“An updated Area 1 TBERA for terrestrial birds and mammals is included as Appendix B to the USEPA-approved Area 1 SRI Report (ARCADIS 2012). The Area 1 TBERA did not revisit the aquatic portion of the Site-Wide Baseline Ecological Risk Assessment (BERA) conducted by CDM on behalf of MDEQ (CDM 2003a), but rather carried forward the BERA conclusions relative to aquatic receptors. The aquatic receptors most at risk (i.e., mink) are primarily exposed via the consumption of PCB-containing fish, so to address risks to aquatic-feeding receptors; the focus of remedy planning for sediments is to reduce PCB concentrations in fish.

The development of the Area 1 TBERA was a coordinated effort among Georgia-Pacific, USEPA, the State of Michigan, and the U.S. Fish and Wildlife Service (USFWS). The participants agreed on key inputs and elements of the assessment, including establishing the focus of the Area 1 TBERA on the terrestrial environment, receptors, and pathways within the former Plainwell Impoundment and the Plainwell No. 2 Dam Area. These two areas were the focus of recent TCRA's completed to address PCBs; therefore, the participants agreed to have the update focus on the assessment of residual risks to terrestrial receptors associated with PCB exposure via the food chain in the former Plainwell Impoundment and the Plainwell No. 2 Dam Area. Representative receptors were selected as the most highly-exposed species likely to inhabit Area 1. The participants also agreed that the Area 1 TBERA would use the inputs to the CDM Site-Wide BERA (CDM 2003a) as a point of departure.

The Area 1 TBERA found no unacceptable risk to either carnivorous birds and mammals or mid-range sensitivity birds. Possible risk was identified for vermivorous mammals in localized areas. Possible, but inconclusive, risk was also identified for high-sensitivity insectivorous birds and vermivorous birds (i.e. birds with greater than 40% worms in diet), if present."

Based on the results of the TBERA and the acknowledged uncertainty in the risk estimates, reduction of unacceptable risks to ecological receptors was considered in this FS.

Note the last sentence was added by EPA.

RAOs/PRGs

Commenting Organization: EPA
General Comment #: 4

Commenter: Saric

RAO 1: Revisions to RAO 1 provided to Georgia Pacific on April 25, 2013 have not been incorporated into the FS (e-mail communication from Jim Saric/EPA to Chase Fortenberry/GP, Area 1 FS RAO 1). The agreed upon text, provided below, should be incorporated in to the document.

Protect people who consume Kalamazoo River fish taken from Area 1 from exposure to PCBs that exceed protective levels. The RAO is expected to be progressively achieved over time by meeting the following targets for fish tissue and sediment:

- *Reduction in the Michigan fish advisory level for smallmouth bass to two meals per month (0.11 mg/kg) total PCB concentration in fish tissue within 30 years*
- *Achievement of a non-cancer HI of 1.0 and a 10^{-5} cancer risk within 30 years for the high-end sport angler (100 percent bass diet)*
- *The fish tissue goal for bass will be achieved by reducing sediment PCB SWAC in each of eight segments of the river in Area 1 to 0.33 ppm or less as soon as possible following completion of the remedial action*

Commenting Organization: EPA
General Comment #: 5

Commenter: Saric

The fish PRG used in the FS is inconsistent with RAO 1 (0.11 mg/kg vs. 0.2 mg/kg). In addition, Appendix I uses a "concentration to achieve" of (0.23 mg/kg) which is inconsistent

with RAO 1 and the rest of the FS. The Fish PRG should be 0.11mg/kg, which is consistent with the high end sport angler 100% SMB diet. The fish trends will need to be revised to reflect the time period to achieve the (0.11 mg/kg).

Commenting Organization: EPA
General Comment #: 6

Commenter: Saric

The Flood plain PRG of 11 ppm should include protectiveness statements for avian species, as it was not solely derived based upon shrews.

The RBC of 11 mg/kg PCBs is also assumed to be protective of avian receptors as it represents a balance between risk and uncertainty surrounding the various methodologies and assumptions for calculating risk to avian receptors employed in the TBERA.

This language should be included in the FS along with a reference to Appendix G.

Additional discussion on why the RAL of 20 mg/kg was selected for the floodplains, as well as the percentage of home ranges protected or not protected is required. This information needs to be included in Chapter 2.

Commenting Organization: EPA
General Comment #: 7

Commenter: Saric

The sediment PRG does not provide sufficient rationale for its selection. The discussion should include the use of the MDEQ detection limit, as that was also part of the reasoning behind the selection of (0.33 mg/kg).

Background

Commenting Organization: EPA
General Comment #: 8

Commenter: Saric

Background discussions and comparisons with data from both the Ceresco Dam impoundment (ABSA 1) and the Morrow Dam impoundment (ABSA 2) need to be included. As discussed in comments to the previous version of the FS, EPA does not consider Morrow Dam impoundment a “better” background location. Despite ongoing discussions regarding the use of Morrow Lake and Ceresco Dam data, it is not appropriate to exclude the Ceresco data. Comparisons from both water bodies are necessary in each section of the document where background is discussed.

Fish Tissue Trend Analysis

Commenting Organization: EPA
General Comment #: 9

Commenter: Saric

The Fish trend discussion; Chapter 4, table 4-1 and Appendix I, do not break fish trends down by individual sediment alternatives. EPA requested this trend approach in previous FS comments and our recent discussions. The current FS does not support the conclusions that there are no differences in fish tissue reduction rates between sediment remedies 3 and 4, since this information wasn't provided.

Commenting Organization: EPA
General Comment #: 10

Commenter: Dillon

The use of projected declines in fish tissue PCB concentrations is an important component for the evaluation of remedies. However, the fish tissue trend analysis presented in the FS is technically weak and based in part on unsubstantiated assumptions. As currently presented the trend analysis does a poor job in differentiating remedies. The FS must be revised to incorporate post remedial estimates of tissue trends based on a more technically rigorous analysis such, as BSAFs and/or a regression approach, to better inform the remedy selection process.

Commenting Organization: EPA
General Comment #: 11

Commenter: White

For alternatives S-3A, S-3B, S-4A and S-4B, it is assumed that the fish tissue rate of decline would be 2% during remedial design, 0% during construction, and 3% after construction is completed. However, alternatives 4A/4B include removal of additional sediment along the edges of the channel in Section 3, which will result in a lower SWAC. The fish tissue declines associated with alternatives 3A/3B and 4A/4B would therefore be expected to differ. The FS should be revised to provide a stronger technical basis for estimating the post-remediation fish tissue concentrations (e.g., through the use of a post-remediation SWAC and BSAF, and subsequent decline based on expected fish tissue trends).

Remedy Selection

Commenting Organization: EPA
General Comment #: 12

Commenter: Saric

Delete the scoring and ranking of each remedy as it should not be part of the FS. The ranking is too subjective and EPA does not concur with the scoring and ranking conclusions regarding preferred remedies in Chapters 4, 5, and 6.

Commenting Organization: EPA
General Comment #: 13

Commenter: Saric

The mass removal discussion from the previous FS in relation to RAO 4 for the various sediment alternatives should be included in this FS. The overall remaining mass and potential mass removal from the remaining hot spots provides important information regarding the uncertainty and risk in remedy selection. This is particularly important for the Sed 3 and Sed 4 remedies.

Commenting Organization: EPA

Commenter: Saric

General Comment #: 14

The floodplain remedies need to include a discussion of residential sampling as identified in Chapter 3.

Commenting Organization: EPA
General Comment #: 15

Commenter: White

The proposed long term monitoring program is not likely to be sufficient to verify progress towards achieving the RAOs through MNR. Although the final components of the long term monitoring program will be defined as part of the ROD, a more comprehensive monitoring approach will be required to better understand the relationship between sediment and fish tissue concentrations and verify that MNR is proceeding as expected. At a minimum, add sediment sampling to the long term monitoring scope in the FS.

Commenting Organization: EPA
General Comment #: 16

Commenter: Saric

Sections 2.0 and 2.1 of the FS should include conclusions discussed in Appendix M of the SRI report and an explanation of why the RAOs are therefore only related to PCBs. (This will be important in explaining why the state soil cleanup levels are not applicable – currently the State’s suggested ARARs could be interpreted to require that the cleanup levels for the other constituents be at the Part 201 levels.)

Similarly for Floodplain Soil RBCs and Floodplain Surface Soil PRGs, there needs to be some sort of discussion on how those PCB levels correlate to risk-based cleanup levels for the other COCs.

Commenting Organization: EPA
General Comment #: 17

Commenter: Saric

We will not be waiving TSCA ARARs. The suggested rewrite of the TSCA ARAR section is included in the specific comments below that relates to sections 2.3.1.1. and 2.3.1.2. All references to TSCA waivers should be removed throughout the document.

It also appears that the GP wants to waive the water quality standard ARARs found in Part 31 of the Michigan regulations except for possibly the NPDES requirement for discharge of water into Kalamazoo River after material is dredged – it appears they want to use the same discharge limit used during the time critical removal actions: $2.6 \times 10^{-5} \mu\text{g/L}$.

The FS as written includes the following:

4.7.2.2 Compliance with ARARs

Applicable ARARs are discussed in Section 2.3 and listed in Tables 2-1 through 2-3. Alternative S-5 complies with ARARs, except that technical impracticability waivers would be required for the Michigan NREPA water quality ARARs. These waivers would be required due to:

- Low-level continuing sources to the river that may sustain levels of PCBs in the water column (e.g., from the atmosphere, upstream areas and urbanized areas of the watershed, etc.)

- An inability to detect such low PCB concentration, as current typical water column detection limits are 1.0 to 0.2 ng/L

The time to comply with human health and ecological exposure risk targets in fish for the Area 1-wide removal to an RAL of 1 for alternative S-5 would be 18 to 22 years in smallmouth bass and 28 to 42 years in common carp, following ROD issuance (Table 4-1). The sediment PRG would be met upon completion of excavation.

Based upon this, EPA has the following questions/comments regarding Michigan NREPA ARARs.

1. Specifically, which NREPA water quality requirements does GP suggest to waive? Tables 2-1 through 2-3, list the following: Michigan NREPA (Part 4 of Part 31) Water Resources Protection R324.3101 - R324.3111.
2. Michigan's water quality regulations found at Part 31 that were identified by the State and currently in the FS, if applicable, relevant or appropriate, would be ARARs for each of the proposed alternatives and not just S-5. Does GP think the other potential remedies attain the Water Quality Standards proposed by the State as well as the NPDES and antidegradation requirements mentioned below?

EPA's guidance on CERCLA compliance with the CWA and SDWA explains that on-site discharge from a CERCLA site to surface waters must meet substantive NPDES requirements. The guidance document further describes that direct discharges to include unchanneled runoff from a site into surface water. The CERCLA guidance also explains that state CWA antidegradation and water quality standard requirements may apply to nonpoint sources, (e.g., runoff from the floodplains).

1. As written, the FS does not provide a basis for waiving the water quality ARARs. GP needs to show how it is technically impracticable to achieve the standards. (Other sites, for example the Lower Duwamish Waterway Site, note atmospheric deposition of PCBs from multiple sources that are uncontrolled, but just the same are not waiving water quality standards. Similarly, for example, both the Lower Duwamish and New Bedford Harbor sites plan to meet the water quality standards over time and have proposed ways to measure that compliance.)

Rather than waive the water quality standards because of technical impracticability, GP should consider first evaluating if the water quality standards can be met over time.

SPECIFIC COMMENTS

Commenting Organization: EPA
Section: Executive Summary
Specific Comment # 1

Page #: ES-1

Commenter: White
Lines #:

Second paragraph – in the bulleted list of information included in the FS report, add a bullet for a summary of the Remedial Investigation results and conceptual site model.

Commenting Organization: EPA
Section: Executive Summary
Specific Comment # 2

Page #: ES-2

Commenter: White
Lines #:

The summary of the nature and extent of sediment contamination should include a brief description of the distribution of PCBs in Area 1 in addition to the description of SWACs.

Commenting Organization: EPA
Section: Executive Summary
Specific Comment # 3

Page #: ES-12

Commenter: White
Lines #:

Tables E-5 and E-6 should summarize the comparative analysis of the sediment and floodplain soils relative to the CERLCA evaluation criteria.

Commenting Organization: EPA
Section: 1.3
Specific Comment #: 4

Page #: 1-5

Commenter: White
Lines #:

Recommend renaming this section "Area 1 SRI Summary and Conceptual Site Model." The descriptions of the previous source control actions and TCRAs (Section 1.3.4) should be renumbered as Section 1.4 because these actions were not part of the SRI.

Commenting Organization: EPA
Section: 1.3.1
Specific Comment #: 5

Page #: 1-7

Commenter: White
Lines #:

This section should note that all sediment PCB data are reported as total Aroclors.

Commenting Organization: EPA
Section: 1.3.1.1
Specific Comment #: 6

Page #: 1-8

Commenter: White
Lines #:

Sampling between Crown Vantage Landfill and Plainwell #2 Dam – text summarizing the scope and objectives of this sampling appears to be missing from the beginning of this paragraph.

Commenting Organization: EPA
Section: 1.3.1.1
Specific Comment #: 7

Page #: 1-10

Commenter: White
Lines #:

SWAC and Confidence Interval Results – "The SWAC for Section 8 was developed using primarily pre-Plainwell Dam removal data and [are] not representative of actual PCB SWACs in that section." Please replace the word "actual" with "present-day" and clarify that samples representing areas that were excavated in the TCRA were removed from the data set prior to calculation of the SWAC. This comment also applies to the Executive Summary.

Commenting Organization: EPA
Section: 1.3.1.2
Specific Comment #: 8

Page #: 1-11

Commenter: White
Lines #:

Please add a table summarizing the average PCB concentrations in floodplain soils in Soil Areas 1 through 4.

Commenting Organization: EPA

Commenter: Dillon

Section: 1.3.1.3

Page #: 1-13

Lines #:

Specific Comment #: 9

The fourth paragraph discusses the two approaches used in trend analysis, total Aroclors for fillets and total congeners for whole-body. Please explain the rationale for using different measures even when both Aroclor and congener data were available.

Commenting Organization: EPA

Commenter: White

Section: 1.3.1.3

Page #: 1-14

Lines #:

Specific Comment #: 10

The second paragraph describes the extents of the Urban reach and Dam reach used for fish tissue trend analysis. Please show the extent of these reaches on Figure 1-3.

Commenting Organization: EPA

Commenter: White

Section: 1.3.2

Page #: 1-17

Lines #:

Specific Comment #: 11

Floodplains – "... mobilization of floodplain soil via erosion into the river is not expected to be a major transport mechanism." The potential mobilization of floodplain soil in other (downstream) areas of the river should be addressed using hydrodynamic model results. No change is requested for the Area 1 FS because a hydrodynamic model was not developed for Area 1.

Commenting Organization: EPA

Commenter: White

Section: 1.3.3.1

Page #: 1-21

Lines #:

Specific Comment #: 12

Central Tendency Sport Anglers - "Carcinogenic risks in Area 1 were within USEPA's acceptable risk range ... regardless of the EPC used or the fish consumption scenario evaluated." Tables 1-5 and 1-6 indicate that mixed diet risks are greater than 1×10^{-4} for both the 95%UCL and mean EPCs.

Commenting Organization: EPA

Commenter: White

Section: 1.3.3.1

Page #: 1-23

Lines #:

Specific Comment #: 13

"Reproductive and immunological hazards in Area 1 were indicated by HQs greater than the target of 1 in ABSAs 4 and under both EPCs. ..." Revise to include ABSAs 4 and 5.

Commenting Organization: EPA

Commenter: White

Section: 1.3.3.1

Page #: 1-26

Lines #:

Specific Comment #: 14

Risks and Hazards for Residents and Recreationists Exposed to Floodplain Soil – please include tables summarizing the risks and hazards for each floodplain soil area.

Commenting Organization: EPA

Section: 1.3.3.3

Page #: 1-28

Commenter: Dillon

Lines #: 2nd paragraph 3rd line

Specific Comment #: 15

The text reads “For terrestrial species, vermivorous birds, represented by the American robin...” Later in this section the American robin is referred to as an omnivorous species. Please review the BERA and use consistent classifications for the various receptor groups.

Commenting Organization: EPA

Section: 1.3.3.4

Page #: 1-30

Commenter: Dillon

Lines #: 2nd paragraph 1st line

Specific Comment #: 16

Change “omnivorous birds (American robin and American woodcock)” to *vermivorous birds* (*American robin and American woodcock*).

Commenting Organization: EPA

Section: 1.3.3.4

Page #: 1-130

Commenter: Dillon

Lines #: 2nd paragraph 13th line

Specific Comment #: 17

The text refers to calculating mean EPCs for the wildlife home ranges based on unbiased and biased sediment data. For clarity these data should be referred to as floodplain soil data. Please change here and in subsequent paragraphs.

Commenting Organization: EPA

Section: 1.3.3.4

Page #: 1-30

Commenter: Dillon

Lines #: 3rd paragraph 10th line

Specific Comment #: 18

The text notes high sensitivity and midrange sensitivity toxicity reference values. It should be clarified what is meant by these terms. Please consult section 5.2 of the TBERA.

Commenting Organization: EPA

Section: 1.3.3.4

Page #: 1-30

Commenter: Dillon

Lines #: 3rd paragraph

Specific Comment #: 19

Delete the last two sentences or add more detailed text as presented in the TBERA and ASTM to give a more balanced presentation on the potential site species that might be considered “sensitive.”

Commenting Organization: EPA

Section: 1.3.3.4

Page #: 1-30

Commenter: Dillon

Lines #: last paragraph 1st sentence

Specific Comment #: 20

Please describe high, moderate and low sensitivity.

The recent publication by Manning et.al. 2013, post TBERA, indicates that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners is more complex than the simple classification system of high, moderate and low sensitivity. The results of the current research suggest that there is no simple ratio of species sensitivity between the groups based on AhR structure and that the relative sensitivity is also affected by the mix of congeners, which suggest that sensitivity is partially site-specific.

EPA acknowledges that there continues to be uncertainty around this issue as the science develops further. However, EPA believes that this uncertainty needs to be clearly addressed when characterizing and discussing risk to avian receptors at the site. If the TBERA summary includes expanded discussion of avian species based on sensitivity group and potential presence at the site then a discussion of Manning et.al. 2013 must be included.

G E. Manning, L. J. Mundy, D. Crump, S. P. Jones, S. Chiu, J. Klein, A. Konstantinov, D. Potter, and S. W. Kennedy. 2013. Cytochrome P4501A induction in avian hepatocyte cultures exposed to polychlorinated biphenyls: Comparisons with AHR1-mediated reporter gene activity and *in ovo* toxicity. Toxicology and Applied Pharmacology 266 (2013) 38–47

Commenting Organization: EPA

Section: 1.3.4.3

Page #: 1-39

Commenter: White

Lines #:

Specific Comment #: 21

TCRA Effectiveness – “. . . PCB concentrations in fish tissue were reduced by one order of magnitude . . .” Please identify the type(s) of fish that showed this reduction.

Commenting Organization: EPA

Section: 1.4

Page #: 1-41

Commenter: White

Lines #:

Specific Comment # 22

Media of Concern – this section should be revised to indicate that the media of concern are sediments, fish, and floodplain soils. Hot spots in Sections 2 and 4, the Crown Vantage side channel, and sediments in Section 3 are remediation target areas for some of the remedial alternatives. This comment also applies to the Executive Summary.

Commenting Organization: EPA

Section: 2.2

Page #: 2-1

Commenter: White

Lines #:

Specific Comment #: 23

For completeness, the RAO section should document the approach for addressing all media and pathways that were identified as posing potentially unacceptable risks in the human health and ecological risk assessments. Section 2.2 should explain why there is no RAO related to residents and recreationists exposed to floodplain soil.

Commenting Organization: EPA

Section: 2.3.

Page #: 2-2

Commenter: Saric

Lines #:

Specific Comment #: 24

REPLACE: CERCLA specifies that Superfund remedial actions comply with ARARs of relevant federal, state, and local environmental laws (including Section 121 (d)(2)(A), the NCP, and 40 CFR, Part 300, in addition to CERCLA). There are three broad categories of ARARs: chemical-specific, location-specific, and action-specific.

- Chemical-specific ARARs are numerical standards that specify the acceptable amount or concentration of a chemical that may be found in, or discharged to the environment. These ARARs are specific to the type(s) of constituents, pollutants, or hazardous substances at a site, and include state and federal regulations pertaining to contaminant levels in various media.
- Location-specific ARARs are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely based on their specific geographic locations, such as floodplains, wetlands, historic places, or sensitive ecosystems or habitats.
- Action-specific ARARs are technology-based or activity-based requirements or limitations on actions taken regarding hazardous wastes. Action-specific ARARs are regulatory requirements that define acceptable remedial technologies and are triggered by the particular remedial activities that are selected to accomplish a remedy.

WITH: EPA evaluates ARARs to determine the appropriate extent of site cleanup, scope and formulate remedial action alternatives, and govern the implementation and operation of the selected action.

The NCP at 40 C.F.R § 300.5 defines ARARs as follows:

Applicable requirements are cleanup standards, standards of control, and substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental law, or facility siting laws, that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or any other circumstances at a CERCLA site.

Relevant and appropriate requirements are those cleanup standards, standards of control, or other substantive environmental protection requirements, criteria, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

EPA ARAR guidelines (EPA, 1988) state that the relevance and appropriateness of a requirement is judged by combining a number of factors including characteristics of the remedial action, the hazardous substances in question, or the physical circumstances of the site with those addressed in the requirement. The origin and objective of the requirement may aid in the determination of relevance and appropriateness. A requirement judged to be relevant and appropriate must be complied with to the same degree as if it were applicable. However, more discretion may be used in the determination. Only part of the requirement may be considered relevant and appropriate and the rest dismissed if judged not to be relevant and

appropriate in a given case. Once a requirement is determined to be relevant and appropriate, it must be complied with as if it were applicable.

EPA considers ARARs to fall within three categories (EPA, 1988):

- a) Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment;
- b) Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions or conditions involving specific substances; and
- c) Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas

Commenting Organization: EPA
Section: 2.3.1.1
Specific Comment #: 25

Page #: 2-3

Commenter: Saric
Lines #:

Rewrite to read as follows.

The provisions of the TSCA, as regulated by 40 CFR Part 761, establish requirements for handling, storage, and disposal of PCB-containing materials. This ARAR ~~may be~~ is applicable to PCB-containing materials that ~~either~~ remain on Site. For PCB-containing media remaining in place, the selected remedy would be based on meeting site-specific risk goals to attain a standard of performance that ~~is equivalent to that required under TSCA~~ meets TSCA risk-based disposal requirements. ~~Because the selected remedy would provide for the protection of human health and the environment through risk management, this ARAR may be waived by USEPA for media left in place. Handling, storage, and disposal of excavated PCB remediation waste material with concentrations greater than 50 mg/kg would require consideration of appropriate disposal technologies~~

~~The State generic soil cleanup criteria and screening levels were reviewed, but were concluded to not be ARARs because all the remedial alternatives have more stringent soil cleanup levels for PCBs than required by State regulations and, for reasons discussed above in Section 2.0, subsections 2.1 and 2.2., all other soil criteria set forth in the State regulations are not relevant, appropriate or applicable to the remedial alternatives for reasons discussed above in Section 2.0, subsections 2.1 and 2.2. [discussion of Appendix M from the SRI report will hopefully be in those sections]~~

~~At the State level, soil are subject to regulations listed in Part 201 of the Natural Resources and Environmental Protection Act of 1994 (NREPA). Generic soil cleanup criteria and screening levels are listed under Attachment 1, Table 2, Soil: Residential and Attachment 1, Table 3, Soil: Nonresidential of the MDEQ's Remediation and Redevelopment Division Operational Memorandum No. 1 (Part 201 Cleanup Criteria/Part 213 Risk-Based Screening Levels). The Part 201 Residential Soil Direct Contact Cleanup Criterion for PCBs is 4 mg/kg and the Nonresidential Soil Direct Contact Cleanup Criterion for PCBs is 16 mg/kg.~~

Commenting Organization: EPA

Section: 2.3.1.2

Page #: 2-4

Commenter: Saric

Lines #:

Specific Comment #: 26

Rewrite to read as follows.

Sediment are subject ~~to the Clean Water Act of 1972 Section 404 (CWA 404), as regulated by 40 CFR Part 129 and 62 Fed. Reg. 68354 and~~ NREPA, Part 201 (Environmental Remediation). ~~They also address~~ Part 201 also applies to concentrations of COCs in sediment that can adversely affect biota and their habitats. While Part 201 does not include generic sediment cleanup criteria, Area 1-specific cleanup criteria may be required to address exposure scenarios in Area 1. Part 201 allows development of a site-specific cleanup levels.

PCB contaminated sediments must be disposed of in accordance with the disposal requirements set forth in TSCA regulations at 40 C.F.R. Part 761.

~~The provisions of the TSCA, as regulated by 40 CFR Part 761, establish requirements for handling, storage, and disposal of PCB-containing materials. This ARAR may be applicable to PCB-containing sediment that either remains in place or is removed from Area 1 during remedial action. For PCB-containing sediment remaining in place, the selected remedy would be based on meeting site-specific risk goals to attain a standard of performance that is equivalent to that required under TSCA. Because the selected remedy would provide for the protection of human health and the environment through risk management, this ARAR may be waived by USEPA for sediment left in place. Handling, storage, and disposal of excavated PCB remediation waste material with concentrations greater than 50 mg/kg would require consideration of appropriate disposal technologies.~~

Commenting Organization: EPA

Section: 2.4.

Page #: 2-9

Commenter: Dillon

Lines #:

Specific Comment #: 27

The paragraph presents the general basis for the RBCs for human receptors but does not include a similar discussion for ecological receptors. Please add a brief description indicating that RBCs for ecological receptors represented a risk range (i.e., NOAEL and LOAEL) for each receptor group.

Commenting Organization: EPA

Section: 2.4.1

Page #: 2-9

Commenter: White

Lines #:

Specific Comment #: 28

Appendix B of the BHHRA should be provided as an appendix to the FS because it provides key supporting information for the development of risk-based concentrations for fish.

Commenting Organization: EPA

Section: 2.4.2

Page #: 2-10

Commenter: White

Lines #:

Specific Comment #: 29

The second paragraph notes that ABSA-02 is physically separated by the Morrow Dam impoundment from Area 1. Please expand this discussion to assess the degree to which the fish populations are physically separated from each other. The last sentence in the third paragraph states that PRGs for Area 1 should not be set lower than concentrations in Morrow Dam impoundment because it is directly upstream. However, it is possible that fish tissue concentrations in Area 1 could decline below concentrations in Morrow Dam impoundment because of the differences in habitat and the physical barrier between the two areas.

Commenting Organization: EPA

Commenter: Dillon

Section: 2.4.2 **Page #:** 2-10

Lines #: last paragraph 1st sentence

Specific Comment #: 30

The conclusion is drawn that fish sample site ABSA-02 is the most representative for use as background. The text does not provide adequate justification for that conclusion. Please expand the discussion supporting the conclusion or drop ABSA-02 as the preferred background location.

Commenting Organization: EPA

Commenter: White

Section: 2.4.2.1

Page #: 2-11

Lines #:

Specific Comment #: 31

Third paragraph – “Generally, smallmouth bass fillet tissue PCB concentrations declined in ABSA-01, but increased slightly in ABSA-02.” Please indicate whether these trends are statistically significant.

Commenting Organization: EPA

Commenter: White

Section: 2.4.2.2

Page #: 2-11

Lines #:

Specific Comment #: 32

RBCs for fish tissue – “Based on protection of high end sport anglers . . . a risk-based concentration of (RBC_{fish}) of 0.2 mg/kg (non-lipid corrected) was previously calculated . . . ” Table 2-4 indicates that the RBC_{fish} values for the high end sport angler are 0.042 and 0.072 mg/kg.

Commenting Organization: EPA

Commenter: Dillon

Section: 2.4.2.4

Page #: 2-11

Lines #: 1st sentence

Specific Comment #: 33

The text states that lipid normalization was done using the mean percent lipid for fish tissue in each reference ABSA. The lipid normalization should be done with the actual lipid concentration from each fish sampled. Please clarify.

Commenting Organization: EPA

Commenter: White

Section: 2.4.2.2

Page #: 2-11 and 2-12

Lines #:

Specific Comment #: 34

Table 2-5 – please add the RBCs for fish (similar to the format of Table 2-6, which shows lipid-corrected RBCs for fish). On Table 2-6, the footnote related to a lipid-corrected RBC of 0.2

mg/kg is confusing. Is this meant to say “non-lipid corrected”? Additionally, as previously noted, the 0.2 mg/kg tissue value does not correspond to the high end sport angler.

Commenting Organization: EPA

Commenter: White

Section: 2.4.2.3

Page #: 2-11

Lines #:

Specific Comment #: 35

The second paragraph in this section also states that the RBC_{fish} for the high end sport angler is 0.2 mg/kg, which is the same as the fish tissue concentrations in ABSA-02. As noted above, the RBC_{fish} of 0.2 mg/kg corresponds to the upper end of the range for the central tendency sport angler.

Commenting Organization: EPA

Commenter: White

Section: 2.4.3

Page #: 2-12

Lines #:

Specific Comment #: 36

Selection of fish tissue preliminary remediation goals – please add a figure similar Figure 2-1 for sediment that shows individual RBC_{fish} values for specific risk and hazard levels, concentration ranges for the various fish advisory levels, and ABSA-01 and ABSA-02 reference area concentrations. The fish advisory range for one meal per month is 0.21 to 1.0 mg/kg, not 0.11 to 0.21 mg/kg as cited in the text.

Commenting Organization: EPA

Commenter: Dillon

Section: 2.4.4

Page #: 2-12

Lines #:

Specific Comment #: 37

The text discussing BSAFs indicates that %lipid and %TOC are used but then reports those parameters in their fractional equivalent. Please edit the section to use consistent terminology.

Commenting Organization: EPA

Commenter: White

Section: 2.4.4

Page #: 2-14

Lines #:

Specific Comment #: 38

Figure 2-1 – this figure should show the point concentrations for each type of angler and effect (i.e., should show the RBCs for risk and hazard for each angler separately instead of as a range). Also add the mean and 95%UPL for reference to this figure. Showing the full range of RBCs and background concentrations will provide a more complete picture to support selection of the sediment PRG.

Commenting Organization: EPA

Commenter: Saric

Section: 2.4.6

Page #: 2-14

Lines #:

Specific Comment #: 39

In the sediment PRG discussion the applicability of the Michigan part 201 PCB detection limit, should also be included, as an additional factor influencing the PRG.

Commenting Organization: EPA

Commenter: Dillon

Section: 2.4.6

Page #: 2-15

Lines #: 1st paragraph 1st sentence

Specific Comment #: 40

Change the sentence to read, *"The site-wide, risk based floodplain soil concentrations (RBC_{soil}) for the protection of human receptors were derived in....."*

Commenting Organization: EPA**Section: 2.4.6****Page #: 2-15****Commenter: Dillon****Lines #: last paragraph****Specific Comment #: 41**

Delete this paragraph it is redundant with summaries of the TBERA presented earlier in the document. Replace with the following: *"The Area 1 TBERA (ARCADIS 2012d) presented a range of soil RBCs for terrestrial receptors. Table 2-10 presents a summary of the potential RBC_{soil} for ecological receptors."*

Commenting Organization: EPA**Section: 2.4.7****Page #: 2-16****Commenter: Dillon****Lines #: 1st line of section****Specific Comment #: 42**

Change "terrestrial mammals" to *maximally exposed wildlife*.

Commenting Organization: EPA**Section: 2.4.7****Page #: 2-17****Commenter: Dillon****Lines #: 2nd to last sentence****Specific Comment #: 43**

The text reads: "this PRG is between the geometric mean and arithmetic mean of the range of RBC_{soil} determined for the short-tailed shrew." Change the text to read as follows, *"This PRG is the geometric mean of the no observable adverse effect level (NOAEL) and lowest observable adverse effects level (LOAEL) and is considered a reasonably conservative estimate of the potential toxicity threshold that would be protective of maximally exposed wildlife species. Based on the analysis in the ASTM, this RBC is shown to be protective of 94% of the home ranges for maximally exposed mammalian receptors such as the shrew. The RBC of 11 mg/kg PCBs is also assumed to be protective of avian receptors as it represents a balance between risk and uncertainty surrounding the various methodologies and assumptions for calculating risk to avian receptors employed in the TBERA."*

Commenting Organization: EPA**Section: 3.1.1****Page #: 3-2****Commenter: White****Lines #:****Specific Comment #: 44**

The sediment technology screening does not consider in situ treatment (e.g., addition of an activated carbon amendment to the sediment) because the effectiveness of the technology had not been demonstrated at the time the technology screen was first performed. Sediment amendments have since been tested and shown to be effective at a number of sites. The technology screen should be updated to reference in situ treatment, perhaps in conjunction with the evaluation of thin layer capping.

Commenting Organization: EPA**Section: 3.2.1****Page #: 3-7****Commenter: White****Lines #:****Specific Comment #:45**

"The sediment PRG of 0.33 mg/kg for PCBs would be met by reducing the SWAC from 1 or less to 0.33 mg/kg . . . " Should this be " . . . from 1 or more . . . " ?

Commenting Organization: EPA

Commenter: Saric

Section: Figure 3-6

Page #: 3-14

Lines #:

Specific Comment #:46

The process flow diagram does not include Portage Creek which is part of Area 1.

Commenting Organization: EPA

Commenter: Saric

Section: 3.2.3.2

Page #: 3-19

Lines #:

Specific Comment #:47

The recommendation for future residential sampling is not carried forward and discussed with each of the floodplain remedies in Chapters 5 and 6.

Commenting Organization: EPA

Commenter: White

Section: 4.2.1

Page #: 4-2

Lines #:

Specific Comment #:48

The proposed long term monitoring program is not likely to be sufficient to verify progress towards achieving the RAOs through MNR. Although the final components of the long term monitoring program will be defined as part of the ROD, a more comprehensive monitoring approach will be required to better understand the relationship between sediment and fish tissue concentrations and verify that MNR is proceeding as expected. At a minimum, add sediment sampling to the long term monitoring scope in the FS.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-3

Lines #:

Specific Comment #: 49

The first paragraph states that current rates of fish tissue declines range from 0% to 7.7% per year, and these rates are applied to all types of fish in Appendix I to estimate a range of recovery times. However, the species-specific rates should be used for each species (i.e., 0% to 4.5% for smallmouth bass).

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-3

Lines #:

Specific Comment #: 50

First paragraph - "These rates represent a variety of conditions . . . and include, but are not limited to . . . natural recovery." Delete the phrase "natural recovery" because all of the processes in the preceding list are natural recovery processes.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-3

Lines #:

Specific Comment #: 51

The time to achieve RAOs will need to be updated based on the revised fish tissue PRGs.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-3

Lines #:

Specific Comment #: 52

Table 4-1 – footnote c indicates that the “concentration to achieve” value for fish tissue corresponds to the high end sport angler RBC presented in Figure 2-1. Figure 2-1 presents sediment RBCs, not fish tissue RBCs.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-3

Lines #:

Specific Comment #: 53

Fifth paragraph - “Time to reach overall sediment goals in Area 1 will therefore be faster than the overall fish tissue recovery periods listed in above . . .” The RAO 1 language provided by EPA in April 2013 indicated that the sediment target would be applied to each of the eight segments of the river, so the time to achieve the sediment goal will be limited by the section that is slowest to recover.

Revise the text to indicate that achievement of the sediment goal will be verified through long term monitoring.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.1

Page #: 4-4

Lines #:

Specific Comment #: 54

“Therefore, bank erosion in Area 1 is not significantly contributing to downstream PCB transport.” This conclusion is based on a single visual inspection survey performed in June 2013, which is not sufficient information to support this conclusion. The report should acknowledge that bank erosion in unremediated areas will be an ongoing source of PCB loading to the river channel and to fish. The text indicates that monitoring would include the restored banks in the TCRA area and unremediated PCB deposits in Sections 2, 3, and 4 and the Crown Vantage side channel. The riverbanks in unremediated areas should also be included in the monitoring program.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.2

Page #: 4-4

Lines #:

Specific Comment #: 55

Second paragraph - “Time to achieve overall sediment goals (chemical-specific ARARs) in Area 1 is expected to be faster than the overall fish tissue recovery periods . . .” The sediment and tissue goals are not chemical-specific ARARs because they are not promulgated cleanup standards. This comment applies to the assessment of compliance with ARARs for all alternatives, and to Table 4-9.

Commenting Organization: EPA

Commenter: White

Section: 4.2.2.3

Page #: 4-4

Lines #:

Specific Comment #: 56

Long-term effectiveness – the second paragraph discusses the potential for sediment erosion to expose more highly contaminated subsurface sediments. In the absence of a hydrodynamic model for Area 1, the potential for high flows to exposure subsurface contamination cannot be reliably assessed. A hydrodynamic model should be used for the downriver areas of the river to address this question with greater confidence. The text in this section should be revised to clarify that there is a risk of exposing subsurface contamination, but if exposed, natural recovery processes would be expected to mitigate the effects of that contamination over time.

Commenting Organization: EPA**Section: 4.3.2.3****Page #: 4-8****Commenter: White****Lines #:****Specific Comment #: 57**

Long-term effectiveness – This section should note that the removal of buried PCB-containing sediment addresses RAO 4 (whereas MNR alone does not).

Commenting Organization: EPA**Section: 4.4.1****Page #: 4-9****Commenter: Andrae****Lines #:****Specific Comment #: 58**

Is the water depth sufficient to accommodate the 12-inch sand cap and 6-inch gravel layer (18-inch total)?

Commenting Organization: EPA**Section: 4.5.1****Page #: 4-10****Commenter: Andrae****Lines #:****Specific Comment #: 59**

Is the primary purpose of the sand cap to prevent resuspension of the residuals or to dilute the concentration of the PCBs to meet a SWAC?

Commenting Organization: EPA**Section: 4.5.2 .1 and 4.5.2.3****Page #: 4-11****Commenter: White****Lines #:****Specific Comment #: 60**

Overall protection of human health and the environment for alternative 4A (*and 4B) is considered to be similar to S-3A (and 3B), with the same fish tissue trends. However, the SWAC in Section 3 would be reduced to a greater degree for Alternative 4A, which is expected to result in greater fish tissue reductions. The technical basis for predicting post-remediation fish tissue concentrations should be strengthened; for example, by using a post-remediation SWAC and BSAF, and expected fish tissue trends for subsequent declines. Additionally, the text should be revised to indicate that for Alternatives 4A (and 4B), less contaminated sediment would be available for downstream transport, which addresses RAO 4 to a greater degree than SA-3A (and-3B).

Commenting Organization: EPA**Section: 4.7.2.1****Page #: 4-15****Commenter: White****Lines #:****Specific Comment #: 61**

A 10% step down concentration is assumed based on reductions seen after the Bryant Mill Pond TCRA. The Bryant Mill Pond example may not be sufficiently comparable to the main channel of the river to expect similar results. As noted in previous comments, an alternative approach should be used to predict post-remediation fish tissue concentrations.

Commenting Organization: EPA
Section: 4.8
Specific Comment #: 62

Page #: 4-17

Commenter: White
Lines #:

In the comparative analysis, alternatives should not be quantitatively scored and ranked. The analysis should use symbols similar to what was used in the Draft Area 1 FS Report.

Commenting Organization: EPA
Section: 4.8 and 5.6 and Tables: 4-9 and 5-5
Specific Comment #: 63

Commenter: Andrae

Please remove scoring and ranking columns from table and text.

Commenting Organization: EPA
Section: 5.2.1
Specific Comment #: 64

Page #: 5-2

Commenter: Andrae
Lines #:

Do the ECs include repairing erosion discovered during the inspections or just the inspections?

Commenting Organization: EPA
Section: Appendix G
Specific Comment #: 65

Page #:

Commenter: Saric
Lines #:

As indicated in the General comments the text and footnotes (e.g. table G-3) do not reflect EPA's previous comments on the FS. This Appendix needs to be revised.

Commenting Organization: EPA
Section: Appendix H - S-3A
Specific Comment #: 66

Page #: H-2

Commenter: Andrae
Lines #:

Water treatment should also consider the addition of coagulation/flocculation and clarification or filtration. It is highly unlikely that the bag filters and carbon filters will remove clays and colloids.

Commenting Organization: EPA
Section: Appendix I
Specific Comment #: 67

Page #:

Commenter: Saric
Lines #:

This Appendix needs to provide more information regarding what is being presented in the tables. Also, the Appendix needs to be revised to reflect the appropriate PRG corresponding to RAO 1.

EDITORIAL COMMENTS

Commenting Organization: EPA
Section: 1.2.3 **Page #:** 1-3
Specific Comment #: 1

Commenter: White
Lines #:

River sections are first mentioned in the second paragraph of this section, but the river sections are not defined until page 1-6. Consider moving the bulleted list defining the Area 1 river sections to the beginning of Section 1.2.3.

Commenting Organization: EPA
Section: 1.3.1 .1 **Page #:** 1-9
Specific Comment #: 2

Commenter: Dillon
Lines #: 19

The abbreviation SWAC is used for the first time here. It should be defined.

Commenting Organization: EPA
Section: 1.3.1.3 **Page #:** 1-14
Specific Comment #: 3

Commenter: White
Lines #:

Second paragraph – please cite a map showing the specific ABSA sampling locations (e.g., ABSA-03.5).

Commenting Organization: EPA
Section: 1.3.3.4 **Page #:** 1-30 and 31
Specific Comment #: 4

Commenter: Dillon
Lines #:

It is unclear why the last paragraph on 1-30 and the first on 1-31 are preceded with a bullet notation.

Commenting Organization: EPA
Section: 2.4. **Page #:** 2-9
Specific Comment #: 5

Commenter: Dillon
Lines #: 1st sentence

Please define RBC.

Commenting Organization: EPA
Section: Table 2-10 **Page #:** 2-16
Specific Comment #: 6

Commenter: Dillon
Lines #:

The citation is incorrect. It should be (ARCADIS 2012d).

Change the heading from “Exposed Sediment/Floodplain RBCsoil (mg/kg)” to *RBC for Floodplain Soil in mg/kg total PCBs*.

Commenting Organization: EPA

Commenter: White

Section: Figure 3-3
Specific Comment #: 7

Page #:

Lines #:

Please add a label identifying hot spot S-IM1 in the inset upstream of the Crown Vantage landfill.

Commenting Organization: EPA

Commenter: White

Section: 4.3.2.1

Page #: 4-6

Lines #:

Specific Comment #: 8

Third paragraph - reference to Table 4-2 should be Table 4-3.

DRAFT